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**IN THE UNITED STATES PATENT
AND TRADEMARK OFFICE**

Inventor: Edgar Hidalgo Vargas

***CONTAINER AND COUPLING SYSTEM FOR TRANSFERRING
GRANULAR AND OTHER MATERIALS***

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RESPONSE AND CLARIFICATIONS to the written opinion from the International Preliminary Examining Authority

1. Claim 1 has been modified following the suggestions in points 1 and 3. Claim 1 was rewritten in a less broad way and specifically taking into account only the improvements and new features of the new invention, keeping aside other characteristics that belong to the previous art. For more details see the response to point 6 and the new description.
2. Claims 4 and 7 were eliminated.
3. Claim 1 was written again to make some corrections.
4. Document D2 was identified in the previous art and has been considered in the response to point 6 and the new description.
5. References with numbers in parentheses were incorporated to make the claims more understandable.
6. Claim 1 was written again in a less broad way in particular taking into account improvements and new features of the new invention while other characteristics that belong to the previous art have been separated and put aside. Edgar Hidalgo was first in developing, the system in Costa Rica. This is reflected in the previous art through several patents in Costa Rica and patent US5967383 of the same inventor, which later was used to obtain patents of the same system in other countries. This invention was developed mainly due to the need for a container and closed transferring system in the banana plantations of Costa Rica, and other banana producing countries, where pollution was excessive and manipulation of toxic granulated products is extremely dangerous. The new invention is a system better than the previous art because of its more efficient performance and functionality in banana

J.B./V.P./J.S.

plantations. The new invention is constructively different from the previous art. Besides that, the new invention is superior in the total return of granulated material from the dispensing pumps to the spherical containers without leaving remaining material in the pumps. The novelty of this invention is explained in more detail in the new description

DIFFERENCES BETWEEN THE NEW TRANSFERRING SYSTEM FOR GRANULATED MATERIAL AND THE PREVIOUS ART

A) Previous Art in Documents D1 and D2:

The previous art to our invention "Container and Coupler Assembly for Transferring Granulated Materials and Others" is mainly determined by the knowledge presented in patent US5967383 and, in a less important way, in patent US6305444.

Patent US5967383 is characterized by a transferring system of granulated material from a first container to a second container, through a regulating valve attached to the first container and that couples to a collar that is attached to the second container. It is important to notice that in banana plantations the second container is the tank of a pump used to dispense toxic granulated material. The system of patent US6305444 has very similar characteristics, works in a similar way, and has similar applications to the system of patent US5967383. The operation of the two systems in documents D1 (patent US5967383) and D2 (patent US6305444) of the previous art is performed the same way for both by lifting the first container and turning it upside down to couple the valve that is attached to the first container to the collar attached to the second container and, later, performing a relative rotation between both containers to open the valve and allow the granulated material to be transferred from the first container to the second container. The regulating valve of the patent US5967383 is attached to the first container and has characteristics and elements to make the container hermetic. In both patents considered in the previous art, patents US5967383 and US6305444, a collar is located and attached to the second container to couple the regulating valve and transfer the material from the first container to the second container.

B) Particular Characteristics of the New Invention:

- *New spherical container.* The new invention has a new first container that is characterized by having a new spherical shape and superior and inferior supports with openings to hang the container in an inverted or normal position, using a cable or a rope through said openings. Elements to hang the spherical container, like the opening at the base, are important in applications like in banana plantations where there is an elevated transporting cable with joined rolling elements that travel along the cable. Along such transporting cable, banana bunches are hung from the rolling elements and are pulled with a rope by a worker to transport the fruit from the banana plantation to the processing plant. The same elevated transporting cable is used to transport the new spherical container hung upside down and to hold it in that position at a height such that the granulated material inside the spherical container falls by gravity, avoiding the need to lift the spherical container each time granulated material is required to be transferred toward another container or dispensing pump. Then, the workers that operate the dispensing pumps with granulated material should only walk to the hung spherical containers and refill the dispensing pumps with granulated material without having to lift the spherical containers. Consequently, with the new spherical container and the new design of the transferring system, said workers should only couple and activate the regulating valve to refill their dispensing pumps without having to lift the spherical containers. The new design of the transferring system is characterized by having a new nozzle, a new design of the transferring valve and a new cap-collar for the dispensing pump, which is explained next.
- *New Nozzle.* Attached to the spherical container there is a nozzle with superior wall inclined to expedite the complete evacuation of the material in the spherical container when the latter is hung in an inverted position. Such nozzle has a plug, a flat gasket, an o-ring gasket, a cover, and security seals that are used to make said spherical container hermetic and to protect its content during transportation and storage. When the content is toxic material, the hermetic spherical containers protect the environment and the people that manipulate

them. Different from the previous art, the nozzle substitutes the regulating valve attached to the first container, and performs the task of making the container hermetic while it is being transported or stored. The end of the new nozzle is attached to the first end of a flexible hose and the other end of the flexible hose is attached to the regulating valve, which is a new design of the valve used in the system of patent US5967383.

- *New Design of the Regulating Valve:* Even though the opening and closing mechanism of the new valve is the same as the one in patent US5967383, the base of the previous regulating valve was modified, eliminating the thread, and adding a cylindrical extension to attach it to a flexible hose. A rough edge was added to grab and rotate the valve to activate it. Another edge or step was also added to the valve to limit the penetration of the valve inside the cap-collar attached to the second container. These improvements that the same inventor incorporated to the valve of patent US5967383 make the regulating valve more adequate and efficient for the configuration of the new transferring system.

- *New cap-collar:* To perform the coupling of the new regulating valve with the second container, a new cap-collar was designed for such second container, which could be a dispensing pump. The dispensing pump of toxic granulated material, which is used in banana plantations, has a cap threaded on the superior end of its neck. In the previous art, in patent US5967383, a collar was installed inside the neck of the pump, to which the regulating valve was coupled to transfer the material. In the new invention, the function of the cap as well as the function of the collar is achieved with the double purpose and new design of the cap-collar. The new cap-collar has an internal thread at its base to attach to it to the second container or dispensing pump. The new cap-collar has a superior centered or eccentric opening that in its most detailed form has a cylindrical wall extended downward from the superior wall, and said cylindrical wall has L-shaped slots, to which protuberances of the regulating valve are coupled to transfer the material. In addition, the new cap-collar could have a handle formed by one or two arched sections. The new cap-collar has superior surface that is concave, flat, or convex, and has a plug to cover the centered or eccentric

superior opening and avoid spillage of material or penetration of water into the container. In the configuration of the new cap-collar shown in figure 5B, at the end of the cylindrical wall, which forms the superior opening, an inclined section starts and forms a short internal cone, like a funnel, which allows transferring all the material in the other direction, from the pump towards the spherical container. The latter characteristic makes the transferring system bi-directional allowing to collect the granulated material remaining in the dispensing pumps at the end of the workday, and to do so, the spherical container must be located on the floor, the regulating valve is coupled to the pump, and the pump is lifted and turned upside down until empty.

C) Final Comments about the Novelty of the New Invention and the Differences from the Previous Art:

The differences between the new invention and the previous art were explained in points A) and B) above, and the new characteristics of the new invention were indicated. Like it was mentioned and it can be observed from the drawings, the particular characteristics and the functionality of the new invention are not obviously derived from the previous art. The new invention could be used to achieve equivalent functions that are attained with the systems of the previous art; however, the new invention performs in a safe, original, efficient, and practical way additional especial tasks required in agriculture, and more specifically in banana plantations. In other words, our new invention includes and improves the systems of the previous art because it is used to transport, store and transfer material in a safe and more efficient and practical way. In particular, the worker's physical stress required to lift the containers during transferring material has been eliminated, and the exposure of the worker to toxic granulated material is maintained at minimum.

7. Following are the changes that were made to the original patent application. The following paragraph was added to the "previous art" section of the patent application:

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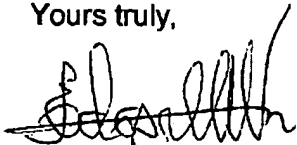
"Patent US6305444 presents a closed system to transfer granulated material by gravity from one container, through a rotational valve that aligns openings for the material to pass through toward another container. The system of the patent US6305444 is similar to the system of patent US5967383 and they operate in similar ways."

Also paragraph A) of this letter with a slight modification (deleting the reference to document D1 and D2) was added to the previous art section of the description. Adding this paragraphs all the pages in the description where affected so we are enclosing a new description.

We are also enclosing new claims, modifying claim number 1. Also, other important changes that were made in the claims are:

- Claims 4 and 7 were eliminated. Now there are only 5 claims.
- Claim 1 was written again.
- Claim 3 becomes new claim 2
- Claim 5 becomes new claim 3
- Claim 6 becomes new claim 4
- Claim 2 becomes new claim 5
- Minor changes were made in claim 3 to better describe the invention
 - In all the claims the name of the piece "cap-collar" was substituted by "cap".

Yours truly,



Edgar Hidalgo Vargas

Applicant

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CONTAINER AND COUPLER ASSEMBLY FOR TRANSFERRING GRANULATED MATERIALS AND OTHERS

Technical Field:

This invention is to be applied in the field of Industrial Agriculture

Background and Previous Technical Status:

This invention has been created and developed taking into account some aspects of other
5 previous patented inventions by the same inventor. Such patents are the following:

Costa Rican patent #2519, from 1995; named Coupling System between Pump and Box
to Load and Unload Granulated Agrochemicals and Others, invented by Edgar Hidalgo
Vargas. This invention is a valve system formed by two concentric cylindrical pieces and a
third piece is a collar. The valve is attached to a container, and the collar is attached to
10 another container. The container with the collar uses the collar to receive and secure the
valve, coupling both containers, and the material can be transferred from one container to the
other. The collar is a key part of this invention, and it is essential to the invention of the
closed system application to transfer granulated agrochemicals from one container to another
by gravity.

15 Costa Rican patent #2552, from 1997; named Improvements to the patent #2519, also
invented by Edgar Hidalgo Vargas. This patent comprises several improvements made to
Costa Rican patent #2519, and that basically consisted of adding a self-locking mechanism to
the valve, several gaskets to make the systems hermetic and waterproof, a cover to protect the
valve, and several minor design modifications to improve performance.

20 Costa Rican patent as Utility Model # MU115, from 1997; named Container to Transfer,
Transport, and Store Granulated Agrochemicals and Others, invented by Edgar Hidalgo
Vargas. This container is used with the systems of Costa Rican patents #2519 and #2552, and
it is used to store, transport, and transfer granulated agrochemical materials and others. This
container was ergonomically designed to ease manipulation; besides, the container is
25 hermetic and waterproof.

USA patent #5967383, from 1998; Container and Coupler Assembly for Transferring
Granulated Material, invented by Edgar Hidalgo Vargas.

Patent US6305444 presents a closed system to transfer granulated material by gravity
from one container, through a rotational valve that aligns openings for the material to pass

through toward another container. The system of the patent US6305444 is similar to the system of patent US5967383 and they operate in similar ways.

The previous art to our invention "Container and Coupler Assembly for Transferring Granulated Materials and Others" is mainly determined by the knowledge presented in patent
5 US5967383 and, in a less important way, in patent US6305444.

Patent US5967383 is characterized by a transferring system of granulated material from a first container to a second container, through a regulating valve attached to the first container and that couples to a collar that is attached to the second container. It is important to notice that in banana plantations the second container is the tank of a pump used to dispense toxic
10 granulated material. The system of patent US6305444 has very similar characteristics, works in a similar way, and has similar applications to the system of patent US5967383. The operation of the two systems in patent US5967383 and patent US6305444 of the previous art, is performed the same way for both by lifting the first container and turning it upside down to couple the valve that is attached to the first container to the collar attached to the second
15 container and, later, performing a relative rotation between both containers to open the valve and allow the granulated material to be transferred from the first container to the second container. The regulating valve of the patent US5967383 is attached to the first container and has characteristics and elements to make the container hermetic. In both patents considered in the previous art, patents US5967383 and US6305444, a collar is located and attached to
20 the second container to couple the regulating valve and transfer the material from the first container to the second container.

Disclosure of the Invention:

This invention is a hanging system to transfer granulated materials or other similar materials toward another container. This new system is to transfer granulated toxic
25 agrochemical materials or other material without spillage or contact of the material with the worker. The system consists of a spherical container, a nozzle, a hose or flexible duct, a regulating valve to regulate the material flow, a cap, and another container. Different from the previous state of the art, which are the patent USA #5967383, and Costa Rican patents #2519, #2552, and # MU115, this new invention has provisions to hang the spherical
30 container, straight up or in inverted position, so that the container can be transported via cable, like in the banana plantations. Besides, the new system makes use of the valve of Costa Rican patents #2519 and #2552, and USA patent #5967383, in an ingenious new way,

locating the valve at the end of a flexible duct, which at the same time is connected to the spherical container. Hence, while the spherical container is hanging, it is inverted to transfer its contents to other containers by gravity. Another novelty of this invention is the new configuration of the fundamental part, the collar of patents #2519, #2552, and USA
5 #5967383, forming a single piece with the cap of the container toward which the material is being transferred. With the new configuration, the cap and the collar are not two separated pieces anymore; instead, the job of both pieces is now performed by a single part, which is a new cap with a centered collar. This way, the pumps used to apply granulated material in the banana plantations do not have to be modified at all; instead, the old caps are changed for the
10 new ones and the pumps are ready to be refilled with the hermetic and waterproof system of this invention. Another novelty of the invention is the spherical container that is used to store, transport, and transfer to other containers. This task is performed with the spherical container in a compact, safe, hermetic way, and the spherical container is easy to manipulation. Other novelties of the invention are the shape and features to hang the spherical container that is
15 used to store, transport, and transfer material to other containers. These tasks are performed with the spherical container in an compact, safe, hermetic way, and the spherical container is easy to manipulate. The spherical container presents a newly designed base with openings to hang it upside down to transfer material by gravity without the need of lifting the container. Tabs with opening are also on the superior wall of the spherical container to hang it in the
20 normal position.

Detailed Description of the Drawings:

This invention is a container and coupler assembly for transferring granulated materials and others as presented in figure 1. The system shown in figure 1 is a spherical container (1), a nozzle (2), a hose or flexible duct (3), a regulating valve to adjust the material flow (4), a
25 cap with a collar or receiver opening (5), and a container (6). This system is used to transfer toxic granulated agrochemicals or other materials, without risk of contact of the material with a user.

The spherical container (1) main purpose is to store, transport, and transfer its content into other containers. The spherical container is compact, safe, hermetic, waterproof, and easy to
30 manipulate. Accessories with specific functions have been added to the container (1) so that the material could be efficiently transferred, stored, and transported. As shown in figure 2, the container has two mushroom-shaped handles (11) (only one of the handles is shown in the

figure), located at the center of concave sections (40). Concave sections (40) were created to accommodate handle members (11), and to allow free space for the worker's hands to move while holding or lifting the container. Handles (11) are located in positions diagonally opposed from one another, and at the center part of the container (1). The spherical container (1) has a treaded neck (9), used to hermetically couple a nozzle (2) or at transferring valve (36) to the container, while using a gasket (8). The container's bottom presents a circular section (14), which works as a base or support to stack up the container one on top of another, as shown in figure 5. When the containers are stacked up one on top of another, bottom section (14), of the container that is on top, is supported on the section (27) of the container that is underneath. The bottom of the container (1) has two vertical sections, (41) and (44), and two horizontal sections, (42) and (43), which have similar shape to the surface of cover (15) of nozzle (2) or valve (36). The containers' bottom is designed so that they can be stacked up one on top of the other when either the nozzles (2) or valves (36) are connected to them. To protect the material that is inside the container, a plug (50) is inserted in the hole (49) of nozzle (2), and a cover (15) is snugly placed on the nozzle (2), or valve (36), and it is held there by means of an o-ring gasket (16), which make the container hermetic and waterproof. Nozzle (2) is shown in detailed in figure 6. O-ring (16) is installed inside a circular slot (45), around the nozzle (2) or valve (36), as shown in figure 6. In addition, nozzle (2) has some openings (10) to place security seals to keep the container closed. Those security seals are placed through openings (10) and openings (47) on the cover (15), and also through openings (48) which are on the top part of the spherical container (1). The container (1) also has some openings (13) to hang it in an inverted way to dispense material by gravity. The container (1) has eyed tabs (17), used to hang the container in non-inverted position and transport it via cable, like in the banana plantations.

As shown in figures 1 and 2, nozzle (2) is coupled to the container (1), and such nozzle has an inclined surface (7) to ease dispensing the material. As shown in figure 1, nozzle (2) is connected to a hose or flexible duct (3), and the other end of the hose is connected to a regulating valve (4). Regulating valve (4) consists of two pieces (4a) and (4b) as shown in detail in figure 4. When piece (4a) is inserted inside piece (4b) until cylinder (35) gets inside the opening (39), pins are inserted inside the openings (46) centered in the protuberances (34), to hold pieces (4a) and (4b) together. The pins are inserted through the holes (46), located at the center of the protuberances (34), and inside slots (38) of piece (4a). These pins

hold pieces (4a) and (4b) together and allow only relative rotation of one piece with respect to the other in order to make the holes (31) and (33) coincide. In case that the protuberances (34) are removed, the pins are still placed through holes (46) in the vertical wall of piece (4b), and in the slots (38) of piece (4a). A spring is used to hold the valve (4) in its closed position, avoiding transferring material unless an external force opens the valve on purpose. The spring is placed around cylinder (35), and one of its ends is supported on a slot centered along cylinder (35). The other end of the spring is fixed to protuberance (37). The user can activate the valve (4), to let the material pass through, by holding with one hand the piece (4a) at section 28, and forcing a relative rotation of (4b) with respect to (4a) with the other hand, grabbing (4b) at rough section (29). Once the user releases the parts (4a) and (4b) the valve closes due to the action of the spring, avoiding accidental material spillage. To transfer material, the valve (4) is inserted in the opening (26) in cap (5) as far as the border (30) hits the cap's superior surface. To perform this coupling, the protuberances (34) slide on the L-shaped slots (22) in cap (5). Protuberances (34), of valve (4), slide on the L-shaped slots (22), keeping the valve attached to the cap while the material is being transferred, and preventing spillage. The system also works without protuberances (34), and in this case the L-shaped slots (22) are not needed. Also, in this latter case, the user must keep valve (4) in contact with cap (5) while material is being transferred.

Cap (5) has different configurations, as shown in figure 3. Cap (5A) has flat superior wall (21) with centered hole (26). Cap (5B) has convex superior wall (18) and centered hole (26). On the other hand, each cap (5C) and (5D) has concave superior walls (23). Cap (5C) has eccentric hole (26), but cap (5D) has centered hole (26). Caps (5C) and (5D) have handle. The handle (24) of cap (5C) is one solid arc, but the handle of cap (5D) consists of two extended pieces that form a discontinuous arc, as shown in figure 3. Caps (5) have a hole (26), with or without L-shaped slots (22), and vertical section (25) with internal thread. Also, caps (5) have plugs (20) to cover the hole (26) and seal the container (6). When valve (4) has protuberances (34), the opening (26), in cap (5), is extended with cylindrical shape below the cap's superior wall and on the walls of opening (26) there must be L-shaped slots (22). In case that valve (4) does not have protuberances (34), cap (5) does not need to have L-shaped slots (22), and the opening (26) does not have to be extended below the cap's superior wall.

The system is bi-directional and can be used to collect the material leftover that is inside the containers (6), and that is required to be transferred to store and transport in container (1).

In summary, this invention consists of a system that transfer material from a container (1), through a nozzle (2), a flexible duct or hose (3), a valve (4), and a cap (5), into a second container (6). The valve (4) is coupled to cap (5) to allow transferring material without spillage and without contact of the user with the material. Besides, the containers are
5 hermetic and waterproof.

Mode of Operation of the Invention:

The container and coupler assembly for transferring granulated materials and others has a spherical container (1), another container (6), and a coupling system (2), (3), (4) and (5) between the containers. The coupling system is flexible and has a valve to regulate the
10 material flow between the containers as shown in figures 1 and 7. The spherical container (1) is used to store, transport and transfer material to other containers. Container (1) could be hanged up-side down to dispense material by gravity, or could also be hanged upward to be transported via cable, like in the banana plantations. As shown in figures. 1 and 2, container (1) is coupled to a nozzle (2), and the latter is connected to one end of the flexible duct (3).
15 The other end of flexible duct (3) is connected to a regulating valve (4), made up by two parts (4a) and (4b) that can rotate one with respect to the other to allow or block the material flow. A spring is used to always keep parts (4a) and (4b) in the closed position.

To transfer the material from container (1) to container (6), the regulating valve (4) is inserted in the opening (26) on the cap (5) as far as the border (30) hits the cap's superior
20 surface. To perform this coupling, protuberances (34) slide on the L-shaped slots (22) in cap (5). The L-shaped slots (22) allow protuberances (34) of valve (4) to enter and slide on to keep the valve fixed to the cap while the material is being transferred, avoiding containers separation and material spillage. The operator can activate the valve by grabbing part (4a), on section (28), with one hand, and with the other hand grabbing part (4b) on section (29),
25 and forcing a relative rotation of the two parts to allow material flow. Once the operator releases parts (4a) and (4b), the valve closes automatically because of the spring's force. The system also works without protuberances (34), and in such case the operator must keep valve (4) pressed against cap (5) while opening the valve, so that the material is safely transferred.

Operation of the system could be done without the container (1) being hanging; however,
30 the container (1) must be lifted in an inverted way by an operator and another operator must couple and open valve (4) to transfer the material to container (6). The mushroom-shaped handles make it easier for the operator to lift and invert container (1).

Even though the operation mode of the system is much more frequent and intense to transfer material from containers (1) toward containers (6), the system is bi-directional, and containers (1) could be used to collect leftovers that are in containers (6), to store and transport the material in a safe and efficient way. The bi-directional operation of the system is important at the end of a work period, when leftover material is still in containers (6). To transfer material from container (6) toward container (1), valve (4) must be fixed directly to container (1), and container (1) is inverted and coupled to container (6), and both containers coupled together are inverted such that container (6) is above container (1). After that, container (6) is rotated to open the valve and transfer the material toward container (1). Another procedure to transfer material from container (6) to container (1) is by placing both containers on the ground, one next to the other, and connecting both with the flexible duct (3), by coupling the regulating valve (4) to cap (5), which at the same time is coupled to container (6). Later, valve (4) is activated, and container (6) is lifted and inverted to transfer the material toward container (1). In the bi-directional operating mode, it is important that valve (4) have protuberances (34), in order for the coupling of valve (4) and cap (5) to be safe and avoid spillage. The later procedure requires that while one operator lifts the container (6), another operator couples and opens the valve (4).

CLAIMS :

1. A container and coupler assembly for transferring granulated materials and others characterized by:

(a) a first container (1) with spherical shape and with openings (13) to hang it, with a nozzle
5 (2) with threaded base hermetically coupled to the neck of said first container, the output end of said nozzle attached to a first end of a flexible hose (3), the second end of said flexible hose connected to the base of a regulating valve (4), the other end of the regulating valve couples to the opening (26) of a cap (5) attached to a second container (6);

(b) a nozzle (2) with plug (50), gasket (8), o-ring gasket (16) and cover (15) that seal said
10 spherical container and make it hermetic to protect its content during transportation and storage, and to protect the environment and people that handle the containers when the content is toxic material; said nozzle (2) with an inclined section (7) to completely evacuate the material by gravity when the spherical container is hung in an inverted position;

(c) a double purpose cap (5) attached to said second container, the first of said purposes is to
15 couple to the regulating valve (4) to join said first container with said second container to transfer material between them, the second of said purposes is to keep said second container hermetically sealed; said cap (5) with plug (20) inserted in the opening (26) to seal said second container;

(d) a regulating valve (4) with a cylindrical end (28) to be attached to flexible hose (3) and
20 with the other end to be coupled to said cap (5) by means of protuberances (34) that penetrate and slide on L-shaped slots (22) to allow transferring material when the regulating valve is open;

(e) a first container (1) with spherical shape and openings (13) at its base (14) as means to
25 hang said first container upside down from rolling elements that travel along an elevated cable like in banana plantations, and to hold said first container hanging on the elevated cable to transfer material by gravity through the transferring system (2,3,4,5) toward said second containers; said first container with openings (17) as means to hang it in normal position.

2. The container and coupler assembly for transferring granulated materials and others of
claim 1 characterized by having a nozzle to dispense material from inside said first container
30 towards said second container, and to receive material in the other direction; said nozzle with base internally threaded to couple it to said first container; said nozzle with a plug and a cover to protect the material inside said first container; said nozzle with a gasket seat to place

said gasket (8) between said nozzle and said first container to make the container hermetic; said nozzle with groove (45) to house O-ring gasket (16); said O-ring gasket makes hermetic contact with said nozzle and said cover; said nozzle and cover with tabs with openings (47 and 10) to place security seals.

5 3. The container and coupler assembly for transferring granulated materials and others of claim 1 characterized by a regulating valve (4) to control material flow; said regulating valve with two concentric cylindrical-shaped parts placed one inside the other, and with pins and slots to hold them together; said pins inserted inside openings in the wall of the external cylindrical-shaped part, and one end of said pins penetrate inside said slots in the wall of the
10 internal cylindrical-shaped part; said cylindrical-shaped parts rotate only with respect to each other; said cylindrical-shaped parts with semicircular openings in both pieces to open or close said regulating valve; said regulating valve with a spring to keep it closed unless it is forced to be open; said regulating valve with or without protuberances (34); said protuberances with concentric holes to insert said pins; said protuberances to slide on L-shaped slots located in a
15 cylindrical wall of said superior opening of said cap; said regulating valve with an end (28) to couple to said second end of said flexible hose, and with a rough edge (29) to grab and activate the regulating valve; said regulating valve with a step (30) to limit the penetration of the valve in said superior opening (26) of said cap.

4. The container and coupler assembly for transferring granulated materials and others of
20 claim 1 characterized by having a cap (5); said cap internally threaded on its base to couple to said second container; said cap with superior central or eccentric opening; said superior central or eccentric opening with or without a downward cylindrical wall extended from the superior wall of said cap; said cylindrical wall with or without said L-shaped slots; said cap with or without handle; said handle formed by one or two arched sections; said cap with
25 concave, flat, or convex superior wall; said cap with plug to hermetically seal said superior central or eccentric opening.

5. The container and coupler assembly for transferring granulated materials and others of claim 1 characterized by a first spherical container (1) with openings in the base and in the superior tabs to hang said first container in an upside down or normal position, respectively;
30 said first container with mushroom-shaped handles, and cooperative bottom to stack up identical containers one on top of the other; said first container with a neck externally threaded to connect said nozzle (2); said spherical container with tabs with opening placed

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near its neck to put security seals between said first container and said nozzle and between said first container and said cover.

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(81) Estados designados (*nacional*): AU, BR, BZ, CR, EC, MX, US.

Publicada:

- con informe de búsqueda internacional
- según de la Regla 91.1)) con una petición de rectificación

(84) Estados designados (*regional*): patente ARIPO (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), patente europea (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR), patente OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

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15 de Abril de 2004

(15) Información sobre la corrección:

véase la Gaceta del PCT No. 16/2004 de 15 de Abril de 2004, Sección II

Declaración según la Regla 4.17:

- sobre la calidad de inventor (Regla 4.17(iv)) sólo para US

Para códigos de dos letras y otras abreviaturas, véase la sección "Guidance Notes on Codes and Abbreviations" que aparece al principio de cada número regular de la Gaceta del PCT.

operarios. El primer contenedor es esférico y fue diseñado para que contenedores idénticos puedan estibarse uno sobre otro, de manera tal que almacenar y transportar los recipientes se hace de una manera eficiente. También, el primer contenedor fue diseñado ergonómicamente para facilitar su manipulación. Además, el sistema es hermético e impermeable para prevenir accidentes debido a regueros o dispersión de material tóxico.

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Este invento es un sistema colgante de transvasado de producto granulado, u otro material similar, hacia otro recipiente. Este nuevo sistema es para transvasar agroquímicos tóxicos u otros productos sin que haya regueros, ni contacto con el usuario. El sistema consta de un contenedor esférico, una boquilla de salida, una manguera o tubo flexible, una válvula reguladora del transvasado, una tapa con collar o agujero receptor, y otro recipiente. A diferencia de la técnica anterior, contenida en las patente USA #5967383, y patentes costarricenses #2519, #2552, y # MU115, este nuevo invento presenta aditamentos para que el contenedor esférico sea colgado de manera normal o invertida y así pueda ser transportado por cable vía, como en las plantaciones bananeras. Además, el nuevo sistema hace uso de la válvula de las patentes costarricenses #2519, #2552 y patente USA #5967383, de una manera novedosa, colocando la válvula en el extremo de un conducto flexible, el cual a la vez está conectado al recipiente esférico. De esta manera el recipiente esférico se mantiene colgando, y se invierte para transvasar su contenido hacia otros recipientes por gravedad. Otra novedad del presente invento es la incorporación de la pieza fundamental, el collar de las patentes #2519, #2552, y USA #5967383, en conjunto con la tapa del recipiente al que se le transvasa el material. Con esta nueva forma, la tapa y el collar no son dos piezas separadas, sino que ahora la utilidad de cada pieza se mantiene pero en una sola pieza, que es una tapa con un collar en el centro. Así las bombas dispensadoras de material granulado que se utilizan en las plantaciones bananeras no se modifican en absoluto, sino que solamente se cambia la tapa y nada más, quedan listas para ser rellenadas con el sistema hermético e impermeable de este invento. Otra novedad es el diseño del recipiente esférico que tiene como objetivo principal servir para almacenar, transportar y dispensar producto hacia otros contenedores. Esta tarea es realizada por el recipiente esférico de una manera compacta, segura, hermética y de fácil manipulación.

Descripción detallada de los dibujos:

Este invento es un contenedor y sistema acoplador de transvasado de producto granulado u otros como se muestra en la figura 1. El sistema presentado en la figura 1 consta de un contenedor esférico (1), una boquilla de salida (2), una manguera o tubo flexible (3), una válvula reguladora del transvasado (4), una tapa con collar o agujero receptor (5) y un recipiente (6). Este sistema es para transvasar agroquímicos tóxicos u otros productos sin que haya regueros, ni contacto con el usuario.

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hacia arriba, y se podría transportar el recipiente por cable vía, como en los bananales.

Como se muestra en las figuras 1 y 2, el recipiente (1) se acopla con una boquilla (2), la cual tiene un embudo interno (7) para facilitar la salida del producto.

5 Se muestra en la figura 1 que la boquilla (2) se conecta a uno de los extremos de una manguera o tubo flexible (3), y el otro extremo de la manguera o tubo flexible se conecta a una válvula reguladora (4). La válvula reguladora (4) se muestra en detalle en la figura 4, en donde se presentan las partes (4a) y (4b). La pieza (4a) se coloca dentro de la pieza (4b) hasta que el cilindro (35) penetre dentro del agujero (39) y entonces se colocan pines o pasadores por los agujeros hechos en el centro de las protuberancias (34), para sujetar a la pieza (4a) sin que se salga de la pieza (4b). Los pines o pasadores que se colocan dentro de los agujeros (46) en el centro de las protuberancias (34), entran dentro de las ranuras (38) de la pieza (4a), sujetándola, y permitiendo giro relativo entre las piezas (4a) y (4b), con el propósito de hacer coincidir los agujeros (31) y (33). En el caso que no se utilicen protuberancias (34), los agujeros (46), en la pared vertical de la pieza (4b), todavía se utilizan para colocar los pines que entran dentro de las ranuras (38) de la pieza (4a). Un resorte se utiliza para mantener las piezas (4a) y (4b) siempre en posición cerrada, de tal manera que no pase producto por la válvula, a menos que la válvula se abra a propósito. El resorte se coloca alrededor del cilindro (35) y uno de sus extremos se apoya en una ranura en el centro del cilindro (35). El otro extremo del resorte se apoya en el pin retenedor (37). El operario puede activar la válvula sujetando con una mano la pieza (4a), en la sección (28) y con la otra mano sujetando la pieza (4b) en la sección (29), y forzando un giro relativo de las piezas para abrir la válvula y dejar pasar producto. Una vez que el usuario suelta las piezas (4a) y (4b), la válvula se cierra automáticamente por acción de la fuerza del resorte, evitando dispersión accidental del producto. Para transvasar producto, la válvula reguladora (4) se coloca dentro del agujero (26) de la tapa (5), hasta que el tope (30) llegue a la superficie superior de la tapa. Para realizar este acople, las protuberancias (34) deslizan dentro de las ranuras (22), en forma de L, de la pieza (5). Estas ranuras (22) en forma de L permiten que las protuberancias (34) de la válvula (4) deslicen sobre ellas, manteniendo la válvula fija a la tapa mientras se está transvasando producto, evitando así regueros. El sistema también funciona sin protuberancias (34), y entonces las ranuras (22) en forma de L no son necesarias. En

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como se muestra en las Figuras 1 y 7. El recipiente esférico (1) se utiliza para almacenar, transportar y dispensar producto hacia otros contenedores. El recipiente (1) se puede colgar de manera invertida para dispensar el producto por gravedad, y también puede colgarse con el cuello hacia arriba para transportarlo por cable vía, como en los bananales. Como se muestra en las figuras 1 y 2, el recipiente (1) se acopla con una boquilla (2), y ésta se conecta a uno de los extremos de un conducto flexible (3), y el otro extremo del conducto flexible se conecta a una válvula reguladora (4), formada por dos piezas (4a) y (4b), que pueden girar una con respecto a la otra con el propósito de permitir o bloquear el paso de producto. Un resorte se utiliza para mantener las piezas (4a) y (4b) siempre en posición cerrada

Para transvasar producto desde el recipiente (1) hacia el recipiente (6), la válvula reguladora (4) se coloca dentro del agujero (26) de la tapa (5), hasta que el tope (30) llegue a la superficie superior de la tapa. Para realizar este acople, las protuberancias (34) deslizan dentro de las ranuras (22) en forma de L de la pieza (5). Estas ranuras (22) permiten que las protuberancias (34) de la válvula (4) deslicen sobre ellas, manteniendo la válvula fija a la tapa mientras se está transvasando producto, evitando así regueros. El operario puede activar la válvula sujetando con una mano la pieza (4a), en la sección (28) y con la otra mano sujetando la pieza (4b) en la sección (29), y forzando un giro relativo de las piezas para abrir la válvula y dejar pasar producto. Una vez que el usuario suelta las piezas (4a) y (4b), la válvula se cierra automáticamente por acción de la fuerza del resorte. El sistema también funciona sin protuberancias (34), y en este caso, el operario debe mantener la válvula reguladora (4) en contacto con la tapa (5), para evitar regueros mientras se transvasa el producto.

La operación del sistema puede realizarse sin que el contenedor (1) esté colgando, pero entonces el contenedor (1) debe ser levantado en forma invertida por un operario y se necesita que otro operario acople y abra la válvula (4) para transvasar el producto al recipiente (6). Las agarraderas en forma de hongo facilitan levantar y voltear el contenedor (1)

Si bien la operación del sistema es mucho más intensa y más frecuente para transvasar producto de los contenedores (1) hacia los contenedores (6), el sistema es bi-direccional y el contenedor esférico (1) puede utilizarse para recoger producto sobrante que se encuentra en los contenedores (6) y que se desea transportar y almacenar en una forma segura y eficiente. La operación bi-direccional del sistema es

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Reivindicaciones:

1. Un contenedor y sistema acoplador para transvasar materiales granulados u otros que se caracteriza por tener:

(a) un primer recipiente esférico que tiene agarraderas en forma de hongo, un cuello con rosca externa para conectarse a una boquilla, o para conectarse a una válvula de transvasado directo, con parte superior de forma cooperativa para que penetre dentro del fondo de otro recipiente idéntico y así estibarlos; con costados con secciones planas para poner etiquetas y optimizar el uso de espacio físico con soportes superiores con agujeros para colgarlo y transportarlo por cable vía; dicho primer recipiente con agujeros en la base para colgarlo de forma invertida y descargar su contenido.

(b) una boquilla, con un empaque, un tapón y un cobertor hermético para sellar e impermeabilizar dicho primer recipiente, con un extremo que se acopla a un primer extremo de un conducto flexible,

(c) un conducto flexible o manguera,

(d) una válvula que regula el paso de material,

(e) una tapa, con un agujero superior con un tapón para cubrir dicho agujero superior; dicha tapa con pared superior plana, cóncava o convexa; con o sin agarradera; unida o acoplada a un segundo recipiente

(f) y un segundo recipiente;

Al acoplarse las anteriores piezas se crea un sistema para transferir material granulado desde un primer contenedor, a través de la boquilla, un conducto flexible, una válvula reguladora, una tapa hacia un segundo contenedor o viceversa. La base de la boquilla se acopla al primer recipiente, el conducto flexible se conecta a la boquilla y la válvula reguladora se conecta al otro extremo del conducto flexible. La tapa se acopla al segundo recipiente. La válvula reguladora se acopla a la tapa formando la conexión entre los dos recipientes.

2. El contenedor y sistema acoplador para transvasar materiales granulados u otros de la reivindicación 1 que se caracteriza por tener un primer recipiente esférico; dicho primer recipiente con agarraderas en forma de hongo, y con fondo con forma cooperativa para estibar contenedores idénticos uno sobre otro; dicho primer recipiente con un cuello con rosca externa para conectar dicha boquilla o

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dicha tapa con superficie superior plana, cóncava o convexa; dicha tapa con un tapón para cubrir dicho agujero superior central o excéntrico.

- 5 7. El contenedor y sistema acoplador para transvasar materiales granulados u otros de la reivindicación 1 que se caracteriza por tener un segundo recipiente; dicho segundo recipiente con o sin rosca para acoplarse a una tapa dicho segundo recipiente y dicha tapa podrían construirse en una sola pieza.

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REC'D 24 JUL 2003	
WIPO	PCT

13 de junio del 2003

Señores
Oficina Española de Patentes
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Tratado de Cooperación en materia de Patentes

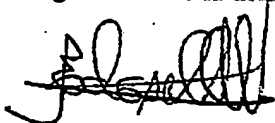
Referencia: Solicitud PCT/CR02/00004

Estimados señores:

De conformidad con la Regla 91 del Reglamento del Tratado de Cooperación en materia de Patentes les solicito muy respetuosamente la corrección de un error evidente en el documento anexo al petitorio de la solicitud número PCT/CR02/00004, en específico en las reivindicaciones. Por un error tipográfico se omitió la reivindicación número 5, poniéndose la número 6 como la número 5 y pasando de la número 5 a la número 7.

Adjunto un nuevo documento corregido para sustituir el erróneo.

Agradeciendo la atención a la presente, me despido atentamente,



Edgar Hidalgo Vargas
Representante
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INTERNATIONAL SEARCH REPORT Information on patent family members

International Application No

PCT/ CR02/00004

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
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INFORME DE BÚSQUEDA INTERNACIONAL Información relativa a miembros de familias de patentes

Sol internacional n°

PCT/ CR02/00004

Documento de patente citado en el informe de búsqueda	Fecha de publicación	Miembro(s) de la familia de patentes	Fecha de publicación
US 5967383 A	19.10.1999	NINGUNO	
US 6305444 B	23.10.2001	CA 2202820 A	30.07.1998
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		ES 2043155 T	16.12.1993

INTERNATIONAL SEARCH REPORT

International application No.

PCT/ CR02/00004

A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 A01M 7/00, A01C 15/00, B67D 3/00

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 A01M, A01C, B67D

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

ES

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

CIBEPAT, EPODOC, WPI, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 5967383 A (HIDALGO) 19.10.1999, the whole document	1-7
A	US 6305444 B (WOODRUFF) 23.10.2001, column 3, line 40-column 11, line 67; figures	1-7
A	ES 2078579 T3 (DEERE & COMPANY) 16.12.1995, column 3, line 38-column 5, line 19; figures	1
A	ES 2143563 T3 (HORSTINE FARMERY Ltd.) 16.05.2000, column 2, line 18-column 4, line 22; figures	1
A	US 4105142 A (MORRIS) 08.08.1978, column 3, line 6-column 4, line 6; figures	1

☐ Further documents are listed in the continuation of Box C.☒ See patent family annex.

* Special categories of cited documents:

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"P" document published prior to the international filing date but later than the priority date claimed

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"&" document member of the same patent family

Date of the actual completion of the international search

12 november 2002 (12.11.2003)

Date of mailing of the international search report

20 Nov 2002 (20.11.03)

Name and mailing address of the ISA/

S.P.T.O.

Authorized officer

Facsimile No.

Telephone No.

INTERNATIONAL SEARCH REPORT
 Information on patent family members

International Application No

PCT/ CR02/00004

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
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INFORME DE BÚSQUEDA INTERNACIONAL

Solicitud internacional n°
PCT/CR02/00004

A. CLASIFICACIÓN DEL OBJETO DE LA SOLICITUD

CIP⁷ A01M 7/00, A01C 15/00, B67D 3/00
De acuerdo con la Clasificación Internacional de Patentes (CIP) o según la clasificación nacional y la CIP.

B. SECTORES COMPRENDIDOS POR LA BÚSQUEDA

Documentación mínima consultada (sistema de clasificación, seguido de los símbolos de clasificación)
CIP⁷ A01M, A01C, B67DOtra documentación consultada, además de la documentación mínima, en la medida en que tales documentos formen parte de los sectores comprendidos por la búsqueda
ESBases de datos electrónicas consultadas durante la búsqueda internacional (nombre de la base de datos y, si es posible, términos de búsqueda utilizados)
CIBEPAT, EPODOC, WPI, PAJ

C. DOCUMENTOS CONSIDERADOS RELEVANTES

Categoría*	Documentos citados, con indicación, si procede, de las partes relevantes	Relevante para las reivindicaciones n°
A	US 5967383 A (HIDALGO) 19.10.1999, todo el documento	
A	US 6305444 B (WOODRUFF) 23.10.2001, columna 3, línea 40 - columna 11, línea 67; figuras	1-7
A	ES 2078579 T3 (DEERE & COMPANY) 16.12.1995, columna 3, línea 38 - columna 5, línea 19; figuras	1-7
A	ES 2143563 T3 (HORSTINE FARMERY Ltd.) 16.05.2000, columna 2, línea 18 - columna 4, línea 22; figuras	1
A	US 4105142 A (MORRIS) 08.08.1978, columna 3, línea 6 - columna 4, línea 6; figuras	1

☐ En la continuación del recuadro C se relacionan otros documentos ☒ Los documentos de familia de patentes se indican en el anexo

* Categorías especiales de documentos citados:

"A" documento que define el estado general de la técnica no considerado como particularmente relevante.

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"&" documento que forma parte de la misma familia de patentes.

Fecha en que se ha concluido efectivamente la búsqueda internacional. 12.noviembre.2002 (12.11.2002)

Fecha de expedición del informe de búsqueda internacional
20 NOV 2002 20 11 02

Nombre y dirección postal de la Administración encargada de la búsqueda internacional O.E.P.M.

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INFORME DE BÚSQUEDA INTERNACIONAL Información relativa a miembros de familias de patentes

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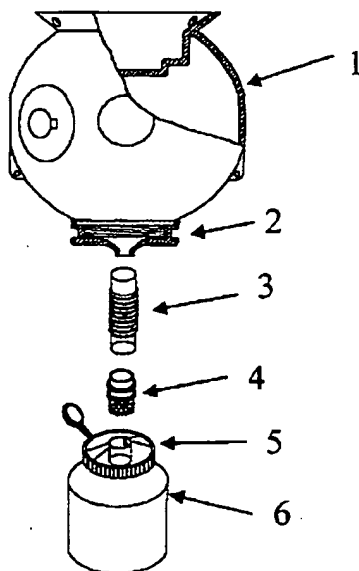
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[Continúa en la página siguiente]

(54) Title: CONTAINER AND COUPLING SYSTEM FOR TRANSFERRING GRANULAR AND OTHER MATERIALS

(54) Título: CONTENEDOR Y SISTEMA ACOPLADOR PARA TRANSVASAR MATERIALES GRANULADOS Y OTROS

Sistema completo
FULL SYSTEM

(57) Abstract: The invention relates to a hermetic system of transferring a material from one container to another. One particular application of the invention involves the transfer of granular agrochemicals on banana plantations. The invention is characterised in that it comprises a system for transferring a granular material from a first container, via a nozzle, a flexible conduit, a control valve and a cover, to a second container, or vice versa. According to the invention, the base of the aforementioned nozzle is connected to the first container, the flexible conduit is connected to the nozzle and the control valve is connected to the other end of said conduit. Moreover, the cover is connected to the second container and the control valve is connected to the cover, thereby forming a connection between the two containers. Once both containers have been connected, the material can be transferred without causing spillages and without coming into contact with the operators. The above-mentioned first container is spherical in shape and is designed such that identical containers can be stacked one on top of the other. In this way, the containers can be stored and transported efficiently. In addition, the first container is ergonomically designed so as to facilitate the handling thereof. The inventive system is hermetic and impermeable so as to prevent accidents resulting from spills or spread of a toxic material.

(57) Resumen: Esta invención es un sistema hermético para transvasar material de un contenedor a otro. Una aplicación particular del invento es para transferir agroquímicos granulados en las plantaciones bananeras. Este invento se caracteriza por ser un sistema para transferir material granulado desde un primer contenedor, a través de una boquilla, un conducto flexible, una válvula reguladora, una tapa, y hacia un segundo contenedor, o viceversa. La base de la boquilla se acopla al primer recipiente, el conducto flexible se conecta a la boquilla, y la válvula reguladora se conecta al otro extremo del conducto flexible. La tapa se acopla al segundo recipiente. La válvula reguladora se acopla a la tapa formando la conexión entre los dos recipientes. Una vez que ambos contenedores están conectados, el material puede ser transvasado sin regueros ni contacto con los

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CONTENEDOR Y SISTEMA ACOPLADOR PARA TRANSVASAR
MATERIALES GRANULADOS Y OTROS

Sector Técnico:

El sector al que se aplica la invención es el sector de la Agroindustria.

Técnica anterior:

Este invento ha sido desarrollado tomando en cuenta algunos aspectos de otros
5 inventos previos patentados por el mismo inventor. Estos inventos previos se encuentran contemplados en las siguientes patentes:

Patente de Costa Rica #2519, de 1995; denominada Sistema de Acoplamiento entre Bomba y Caja para Carga y Descarga de Agroquímicos Granulados y Otros de Hidalgo Vargas. Este invento es una válvula, conformada por dos piezas cilíndricas
10 concéntricas, y además de una pieza en forma de collar. La válvula se une a un contenedor y el collar se une a otro contenedor. El recipiente con el collar, usa el collar para recibir y asegurar la válvula, y así acoplar ambos recipientes, y material puede ser transvasado de un recipiente hacia el otro. El collar es una pieza clave e indispensable en este invento para formar un sistema de aplicación cerrado para el
15 transvasado de agroquímicos granulados de un contenedor a otro por gravedad.

Patente de Costa Rica #2552, de 1997; denominada Mejoras a la Patente #2519, también de Hidalgo Vargas. Esta patente comprende varias mejoras que fueron hechas a la patente costarricense #2519, y que básicamente fue adicionarle un mecanismo de cerrado automático, varios empaques para hacer el sistema hermético e
20 impermeable, un cobertor para proteger la válvula, y varias modificaciones menores para mejorar la operación del sistema.

Modelo de Utilidad de Costa Rica # MU115, de 1997; denominado Recipiente para Transvasar, Transportar y Almacenar Agroquímicos Granulados y Otros, de Hidalgo Vargas. Este recipiente se utiliza con los sistemas de las patentes
25 costarricenses #2519 y #2552, para almacenar, transportar, y transvasar material agroquímico granulado y otros. Es un recipiente diseñado ergonómicamente para facilitar su manejo, además es hermético e impermeable.

Patente USA #5967383, de 1998; denominada Contenedor y Ensamble Acoplador para Transvasar Material Granulado, de Hidalgo Vargas.

30 Divulgación de la invención:

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El recipiente esférico (1) tiene como objetivo principal servir para almacenar, transportar y dispensar producto hacia otros contenedores. El recipiente esférico es compacto, seguro, hermético y de fácil manipulación. Se han proveído aditamentos al recipiente (1) con funciones específicas para que el sistema realice el almacenado, transporte y transvasado de material eficientemente. Como se muestra en la figura 2, el recipiente tiene dos agarraderas (11) (solo se muestra una en la figura), en forma de hongo y colocadas en el centro de las ondulaciones (40). Tales ondulaciones (40) fueron hechas para colocar las agarraderas (11) y a la vez para crear un espacio que permita girar la mano del usuario mientras sostiene o levanta al recipiente. Las agarraderas (11) se encuentran en posiciones diagonalmente opuestas sobre la parte central del recipiente (1). El recipiente esférico (1) tiene cuello roscado (9), para acoplarle boquillas de salida (2), o válvulas dispensadoras de transvasado (36), las cuales se acoplan herméticamente al recipiente utilizando un empaque (8). El fondo del recipiente es tal que presenta una sección circular (14) que sirve como base y además como apoyo para estibar los recipientes uno sobre otro como se muestra en la figura 5. Cuando los recipientes se estiban uno sobre otro, el fondo (14) del recipiente que esta arriba se apoya sobre la sección (27) del recipiente que está abajo. El fondo del recipiente (1) además tiene dos secciones verticales, (41) y (44), y dos secciones horizontales, (42) y (43), las cuales tienen forma similar al cobertor (15) de la boquilla (2), o de la válvula (36). De esta manera, cuando los recipientes se estiban uno sobre otro, la boquilla (2) o válvula (36) se mantiene conectada al recipiente, y aun así la estiba se puede realizar. Para proteger al producto que está dentro del recipiente, se coloca un tapón (50) en el agujero (49), y un cobertor (15) sobre la boquilla (2), o sobre la válvula (36), y este cobertor entra ajustado con un O-ring (16), lo cual hace al recipiente impermeable y hermético. La boquilla (2) se muestra en detalle en la figura 6. El O-ring (16) está instalado dentro de una ranura (45) alrededor de la boquilla (2) y válvula (36), como se muestra en la figura 6. La boquilla (2) tiene además unos agujeros (10) para colocar sellos de seguridad y mantener el sistema sellado. Tales sellos de seguridad se colocan desde los agujeros (10) hasta los agujeros (47) del cobertor y a los agujeros (48) que se encuentran en la parte superior del recipiente esférico. El recipiente (1) también tiene unos agujeros (13) para colgarlo de manera invertida para dispensar el producto por gravedad. El recipiente (1) tiene soportes (17) con agujeros para colgar el recipiente con el cuello

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este ultimo caso, el operario debe mantener la válvula reguladora (4) en contacto con la tapa (5), mientras se transvasa producto.

La tapa (5) tiene diferentes configuraciones, como se muestra en la figura 3. La tapa (5A) tiene pared superior plana (21) y con agujero (26) centrado. La tapa (5B) tiene pared superior (18) convexa y con el agujero (26) en el centro. Por otro lado, las tapas (5C) y (5D) tienen pared superior (23) cóncava. En la tapa (5C) el agujero (26) es excéntrico, pero en la tapa (5D) el agujero (26) es centrado. Ambas tapas (5C) y (5D) tienen agarradera. La agarradera (24) de la tapa (5C) es una sola pieza, mientras que en la tapa (5D), la agarradera está formada por dos piezas arqueadas (19), como se muestra en la figura 3. Todas las tapas (5) tienen un agujero (26) con o sin ranuras (22) en forma de L, y una sección vertical (25) con rosca interna. Además, cada tapa tiene un tapón (20) para cubrir el agujero (26) y sellar el recipiente (6). Cuando la válvula reguladora (4) tiene protuberancias (34), la tapa (5) debe tener ranuras (22), y el agujero (26) se prolonga en forma cilíndrica por debajo de la pared superior de la tapa (5). En caso de que la válvula reguladora (4) no se construya con protuberancias (34), la tapa (5) pueda que no tenga ranuras (22), y que el agujero (26) no se prolongue en forma cilíndrica por debajo de la pared superior de la tapa (5).

El sistema es bi-direccional y se puede utilizar para recoger producto sobrante que se encuentra en los contenedores (6) y que se desea transportar y almacenar en contenedores (1).

En resumen, el sistema de esta invención permite que el producto dentro del recipiente (1) sea transvasado a través de la boquilla (2), la manguera flexible (3), la válvula reguladora (4), y la tapa (5), hacia el un segundo contenedor (6). La válvula reguladora (4) se acopla a la tapa (5) y permite el paso del producto sin riesgo de regueros. De esta forma el recipiente (1) sirve de abastecedor a los recipientes (6), y el transvasado del producto es realizado sin contacto del usuario con el producto y sin riesgo de regueros y contaminación. El sistema es impermeable, hermético y también bi-direccional.

Manera para realizar la invención:

El contenedor y sistema acoplador para transvasado de producto granulado u otros comprende un contenedor esférico (1), otro contenedor (6), y un sistema de acople (2), (3), (4), y (5) entre los recipientes. El sistema de acople es flexible y tiene una válvula para regular el transvasado de producto de un recipiente hacia el otro,

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importante al final de una jornada, o etapa, de trabajo cuando ha quedado sobrante de producto en los recipientes (6). Para transvasar producto del contenedor (6) al contenedor (1) se debe fijar la válvula reguladora (4) directamente a la salida del recipiente (1). El recipiente (1) se voltea y se acopla al recipiente (6), y los dos recipientes en conjunto se voltean hasta que el recipiente (6) quede arriba del recipiente (1), luego el recipiente (6) se gira para abrir la válvula y así transvasar el producto. Otra forma de transvasar desde el recipiente (6) hacia el recipiente (1) es colocando ambos recipientes sobre el suelo, y conectando ambos recipientes mediante el conducto flexible (3), y acoplando la válvula reguladora (4) a la tapa (5), que a la vez esta unida al contenedor (6), luego se activa la válvula (4) y se levanta e invierte el contenedor (6) para que su contenido sea transvasado hacia el contenedor (1). En el caso bi-direccional es importante que la válvula (4) tenga las protuberancias (34), para que el acople de la válvula (4) con la pieza (5) sea mas seguro y así evitar regueros. Este ultimo procedimiento requiere que mientras un operario levanta el recipiente, otro operario acople y abra la válvula.

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5 dicha válvula dispensadora; dicho primer recipiente con aberturas en la base y con agujeros en los soportes superiores para colgarlo en la posición normal o invertido; dicho primer recipiente con costados con secciones planas para etiquetar el producto y optimizar el uso del espacio físico; dicho primer recipiente con pequeñas protuberancias agujereadas y colocadas cerca del cuello para poner sellos de seguridad entre dicho primer recipiente y dicha boquilla o dicha válvula dispensadora, y también para poner sellos de seguridad entre dicho primer recipiente y dicho cobertor.

10 3. El contenedor y sistema acoplador para transvasar materiales granulados u otros de la reivindicación 1 que se caracteriza por tener una boquilla para dispensar material desde dicho primer recipiente hacia dicho segundo recipiente, y para recibir material cuando se transvasa en la otra dirección; dicha boquilla con una base con rosca interna para acoplarse a dicho primer recipiente; dicha boquilla con un tapón
15 para proteger el producto que esta dentro dicho primer recipiente; dicha boquilla con un asiento para empaque para colocar dicho empaque entre dicha boquilla y dicho primer recipiente para impermeabilizar el sistema; dicha boquilla con una ranura a su alrededor para recibir un empaque tipo o-ring; dicho empaque o-ring hace contacto hermético con dicha boquilla y dicho cobertor; dicha boquilla y dicho cobertor con
20 protuberancias agujereadas para poner sellos de seguridad.

25 4. El contenedor y sistema acoplador para transvasar materiales granulados u otros de la reivindicación 1 que se caracteriza por tener un conducto flexible o manguera; dicho conducto flexible con un primer extremo para conectarlo a dicha boquilla de las reivindicaciones 1 y 3; dicho conducto flexible con un segundo extremo para conectarlo a una válvula reguladora.

30 5. El contenedor y sistema acoplador para transvasar materiales granulados u otros de la reivindicación 1 que se caracteriza por tener una tapa; dicha tapa con una rosca interna en su base para acoplarse a dicho segundo recipiente; dicha tapa con un agujero superior central o excéntrico; dicho agujero superior central o excéntrico con o sin una extensión cilíndrica hacia abajo; dicha extensión cilíndrica formando una pared cilíndrica; dicha pared cilíndrica con o sin ranuras en forma de L; dicha tapa con o sin agarradera; dicha agarradera formada por una o dos secciones arqueadas;

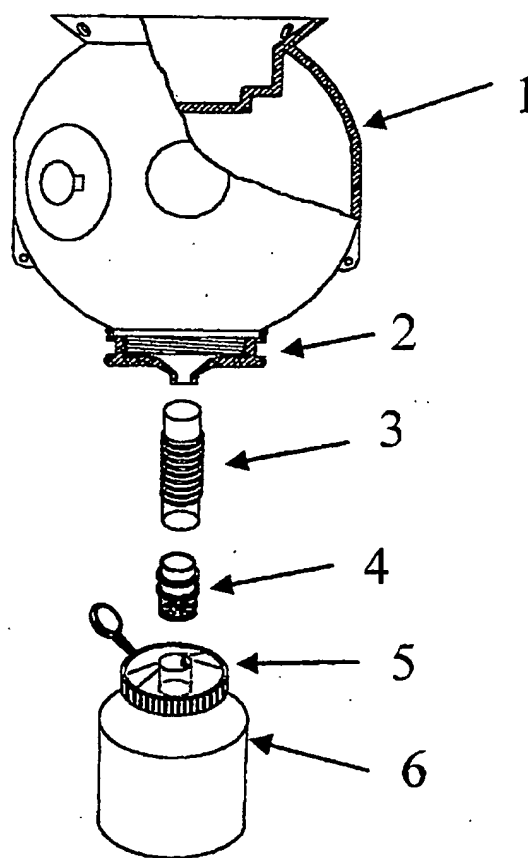


Fig. 1. Sistema completo

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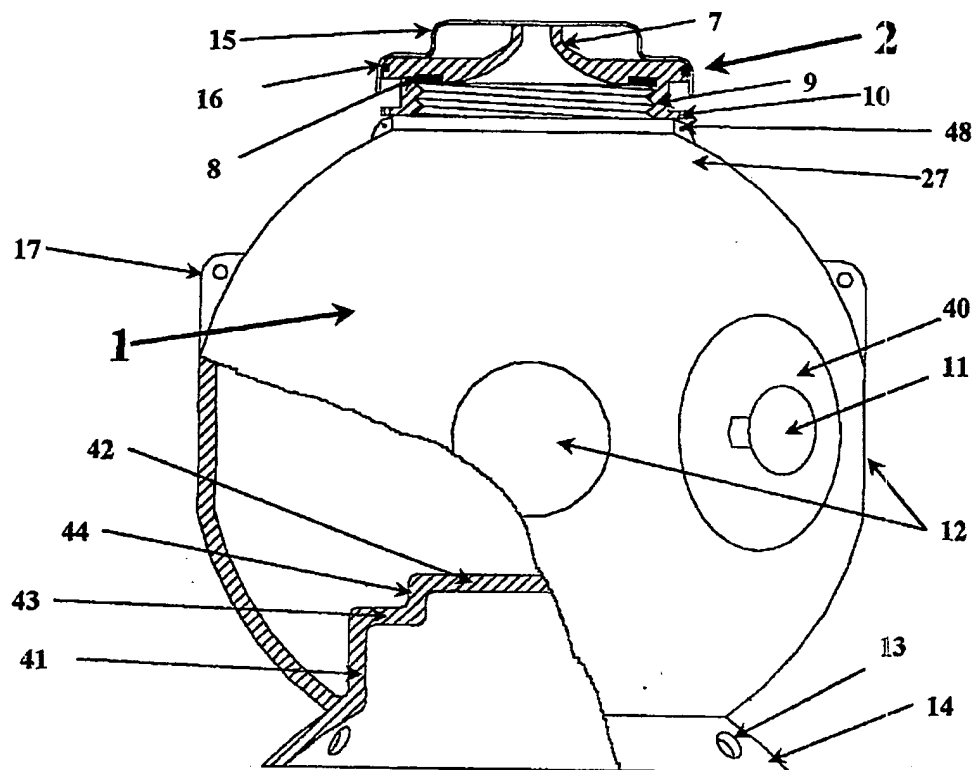


Fig. 2. Contenedor esférico y boquilla para dispensar

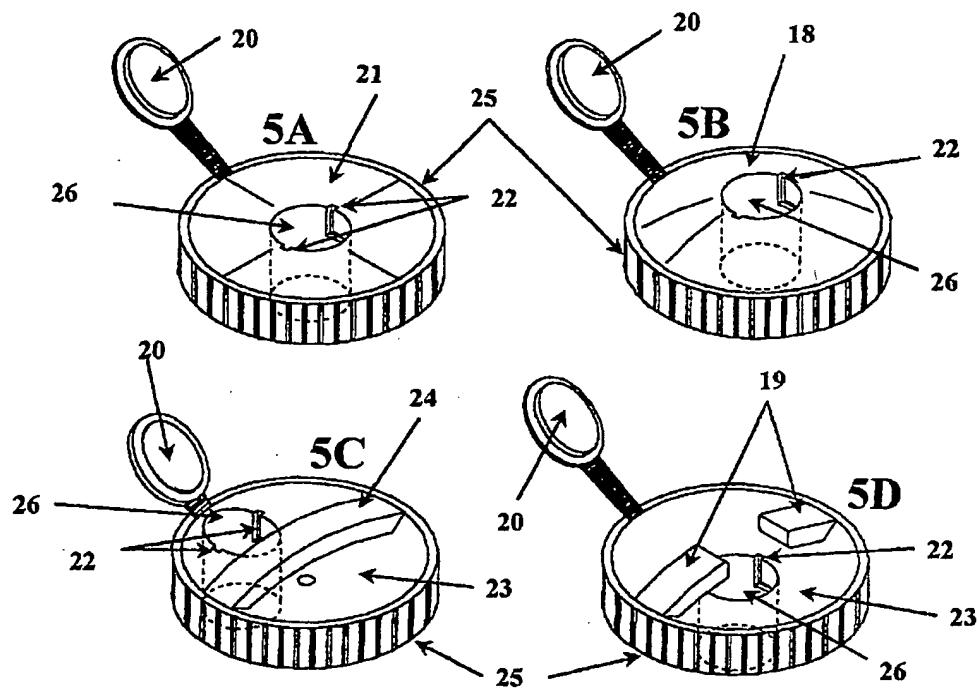


Fig. 3. Tapas

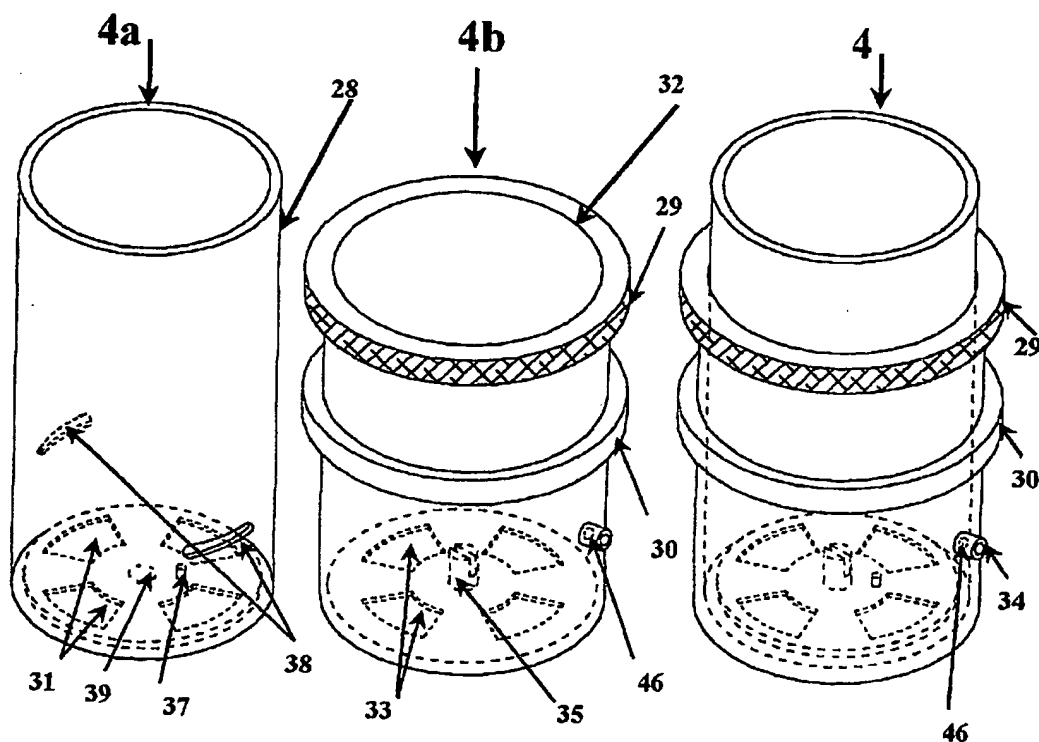


Fig. 4. Válvula reguladora

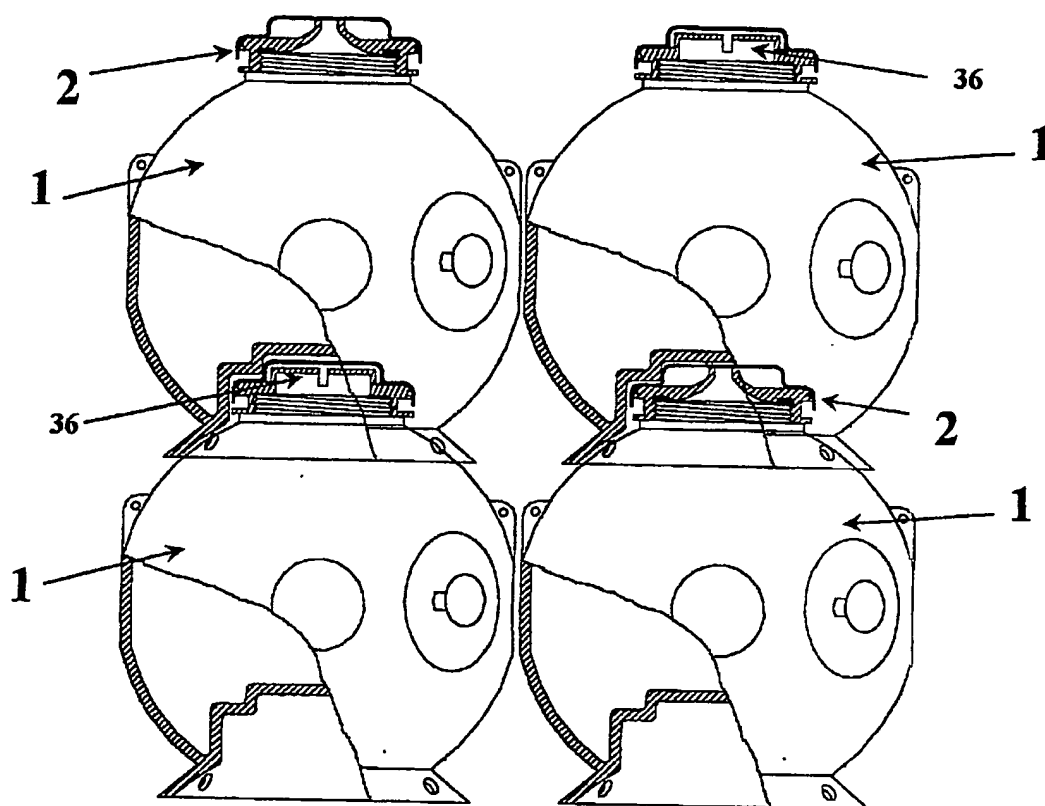


Fig. 5. Estiba de sistemas mixtos

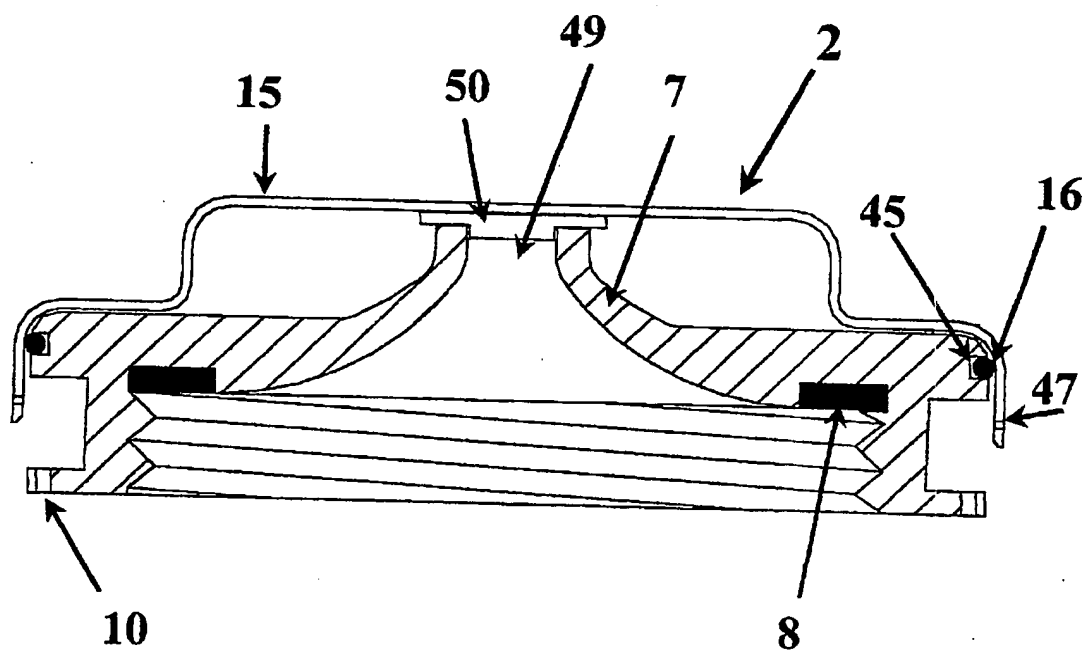


Fig. 6. Boquilla dispensadora

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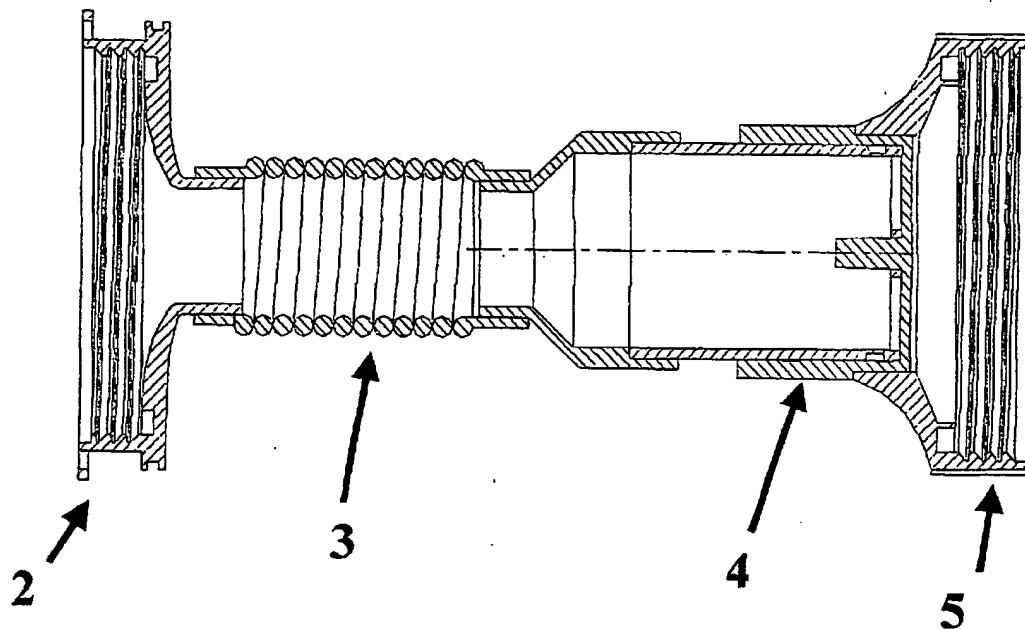


Fig. 7. Sistema ensamblado

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